** Barbie Bungee**

It's time now to use these linear regression skills to actually design something. We're going to create a bungee line for Barbie that will give her the most thrilling, yet safe, fall from a height of 3 meters. Barbie is an adventure seeker to the max. She loves the thrill of death defying activities. She believes the adrenaline rush makes her hair more lustrous and her waistline thinner; so she will pay big bucks to the company which gives her the most thrilling ride. In the back of her mind though, she wants to be sure that she's really safe.

**Step 1:** Connect two rubber bands with a slipknot.  
 Then wrap one end repeatedly around Barbie's ankles. Be sure the rubber band is on tight enough not to fall off when she is being dropped.

**Step 2:**We will measure Barbie's height without rubber bands then we will drop Barbie from the top of a meter stick, and measure the lowest point that her head reaches. We will do this six times, adding a rubber band each time.

The more bands we add, the lower she will drop. You can record your data in a chart that looks like this:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | **Number of bands (x)** | **Lowest point head reaches in cm (y)** | | **0** | . | | **1** | . | | **2** | . | | **3** | . | | **4** | . | | **5** | . | | **6** | . | | **NOTE:** when you drop your doll, you may need to tie her hair back so that you can get an accurate reading from the meter stick |

**Step 3:** Now that you have your seven pieces of data, set up a **titled** and **labeled** graph.

**Step 4:** Find a line of best fit.

**Step 5:** Use your equation to determine how many rubber bands would be needed to drop Barbie from your ceiling to your floor. ( You will need to measure this distance in cm.)

**Step 6**: Now consider the SAFETY issue vs. the THRILL issue.

If you put the number of bands on that you found in step 5, her head will reach the floor, she will crack open her skull, and die. You will then be sued for negligence and will lose your business and owe her family millions of dollars that you don't have.

On the other hand, if you shorten the bungee line TOO MUCH, the ride may not be thrilling enough, and Barbie will pay her big bucks to your competitor. You will lose clients and your business will suffer.

So **make a decision on how many bands you want to use**, then attach that many bands to Barbie's line using slipknots like above.

**Step 10:**Now it's time to drop her and see if she dies or has a great time.